

## PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

## Improvements in or relating to Sealing Means for Tubeless Pneumatic Tyres

We, DUNLOP RUBBER COMPANY LIMITED, a British Company, of 1, Albany Street, London, N.W.1, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to tubeless pneumatic tyres and means for providing an air-tight seal at the beads thereof.

Experience has shown that an ordinary tyre may be used on a one-piece rim without an inner tube so long as adequate precautions are taken to ensure that the tyre beads have sufficient rubber seating against the rim seats and flanges. In giant tyre and wheel assemblies, however, the rim is usually divided to facilitate the mounting of the tyre, and the individual parts do not fit together in an air-tight manner. This increases the difficulty of utilising such rims in conjunction with tubeless tyres.

It has already been proposed to produce the necessary seal by the insertion of bands of rubber between the rim and the tyre beads, but this causes considerable difficulty when mounting the tyre, since the bands are readily carried into the middle of the rim by the tyre beads. It will be appreciated that bands of this kind will not provide a seal in the case of transversely divided rims.

It is an object of the present invention to overcome the difficulties mentioned by providing an improved sealing device for use in association with a tubeless pneumatic tyre, which can be manufactured to suit any size of tyre and any type of wheel rim whether one-piece or circumferentially and/or transversely divided.

According to the invention a sealing device for use in association with a tube-

less pneumatic tyre comprises an annular rubber band of substantially channel-shaped cross-section having a base portion provided with an inflation valve air-tightly secured thereto and adapted to fit around an associated wheel rim base, and two flexible side portions each extending outwardly and adapted to fit closely and to sealingly engage one of the inner side-walls of said tyre.

The flexible side portions of said sealing device enable them, upon inflation of the tyre, to accommodate themselves to the shape of the inner surface of the side-walls of the tyre and thus provide an effective seal.

One or more grooves extending around substantially the whole circumference may be provided in the surfaces of said side portions. If desired, said grooves can be interrupted by means of spaced-apart transverse ribs, disposed in a regular pattern around the circumference of the groove.

For large size tyres it may be convenient to provide reinforcing means for the base part, e.g. textile material vulcanised integrally therewith, so as to give increased stiffness of the base portion.

The region of the valve hole may be provided with extra reinforcing means in that portion of the base adapted to lie on the base of an associated rim. These reinforcing means may consist of textile material vulcanised integrally with the base portion, and will prevent wear of the band caused by rubbing on the rim base or by the band being drawn through the valve hole or slit in the rim.

The invention will now be described with reference to the drawing which illustrates, in cross-section, a preferred embodiment of the sealing device in association with a rim and a tubeless pneumatic tyre mounted thereon.

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The rim 1, which is divided transversely, carries, between the side flanges 2, the beads 3 of a tyre 4. An annular rubber band 5 of channel-shaped cross-section fits around the rim 1, its base portion 5a being located between the beads 3 of the tyre 4. Two side portions 7 of the band 5 extend so as to fit closely and to sealingly engage the inside surface of the sidewalls 6 of the tyre 4. The band 5 is provided with an inflation valve 9 of known construction. This valve is vulcanised in a suitable valve hole in the base portion 5a of the band 5. Its stem 15 extends through a hole in the rim base 1.

Under the increased pressure within the tyre 4 caused by inflation through the valve 9, the base portion 5a of the band 5 is forced against the rim base 1, bridging 20 and sealing any gaps therein due to its being divided transversely. At the same time the side portions 7 seat themselves against the sidewalls 6 of the tyre 4, so that there also an air-tight seal is 25 obtained.

In the sealing device as represented in the drawing the side portions 7 are of lesser thickness, and therefore more flexible, than the base portion 5a.

30 In order to increase the air-tight seal between the side portions 7 and the inner sidewall 6 of tyre 4, the side portions 7 are provided, on the side which bears on the wall, with a number of circumferentially extending annular grooves 8 35 which are interrupted by spaced-apart cross-ribs (not shown), disposed in a regular pattern around the circumference of said grooves.

40 Whereas the drawing shows a flat rim base, it is obvious that the base portion 5a of the band 5 can be shaped in any form to fit rims of any other profile.

Rubber, where mentioned in this 45 specification refers to a natural rubber or to a vulcanisable synthetic rubber such as a butadiene-styrene copolymer.

What we claim is:—

1. A sealing device for use in association with a tubeless pneumatic tyre comprising an annular rubber band of substantially channel-shaped cross-section having a base portion provided with an inflation valve air-tightly secured thereto and adapted to fit around an associated 55 wheel rim base, and two flexible side portions each extending outwardly and adapted to fit closely and to sealingly engage one of the inner sidewalls of said tyre.

2. A sealing device according to Claim 1, wherein each of said side portions has the surface which is adapted to face the associated inner sidewall of the tyre provided with at least one groove extending 60 around substantially the whole circumference.

3. A sealing device according to Claim 2, wherein said groove is interrupted with spaced-apart cross-ribs disposed in a 70 regular pattern around the circumference of the groove.

4. A sealing device according to any one of the preceding claims wherein the thickness of the base portion is greater 75 than that of said side portions.

5. A sealing device according to Claim 4, wherein said base portion is provided with reinforcing means.

6. A sealing device according to any 80 one of the preceding claims wherein said base portion is provided with reinforcing means in the vicinity of said inflation valve in that portion of the base adapted to lie on the base of an associated rim. 85

7. A sealing device for a tubeless pneumatic tyre constructed and arranged substantially as hereinbefore described and illustrated in the accompanying drawing.

8. In combination a sealing device 90 according to any of the preceding claims, a tubeless pneumatic tyre, and a rim on which said sealing device and said tyre are mounted.

G. W. I. SHEAVYN.

Agent for the Applicants.

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1 SHEET This drawing is a reproduction of  
the Original on a reduced scale

